Case reports

Psittacosis: diagnosis and management of severe pneumonia and multi organ failure

A. P. Wainwright, A. C. Beaumont and W. J. Kox

Department of Anaesthesia, Charing Cross and Westminster Medical School, Charing Cross Hospital, London, UK

Received: 15 February 1986; accepted: 12 November 1986

Abstract. Two patients were admitted directly to our Intensive Care Unit in acute respiratory failure due to pneumonia with septicaemic shock, renal and hepatic impairment. Sputum and blood cultures failed to grow any organisms and despite broad spectrum antibiotic therapy for 7 days, neither patient improved. Diagnosis of the rare pneumonic form of psittacosis was made following a raised titre. After treatment with tetracyclines, both patients made a rapid recovery. Retrospective direct questioning revealed that they had close contact with psitacine birds.

Key words: Psittacosis – Respiratory failure

Psittacosis, an uncommon "atypical pneumonia" is caused by Chlamydia psittaci, an obligate intracellular parasite closely related to gram negative bacteria. The infection is systemic and the illness varies from a mild to a very severe pneumonia with multisystem disease [2, 5]. The two cases reported here demonstrate severe pneumonia causing respiratory failure complicated by other organ involvement.

Case reports

The first patient, a 51-year-old man, had been treated with erythromycin for a chest infection by his general practitioner. Subsequently he had developed increasing shortness of breath, a cough productive of green sputum, abdominal pain and pyrexia. His past history included severe hypertension with chronic renal failure (creatinine clearance 49 ml/min). On admission to our Intensive Care Unit he was centrally cyanosed, dyspnoeic at rest and reacting only to painful stimuli. He had clinical and radiographic signs of a generalised pneumonia (Fig. 1). His blood pressure was 100/40 mmHg, pulse 120/min, and he had passed only 100 ml of urine in the last 12 h. Blood results on admission: Na 132 mmol/l, K 6.1 mmol/l, urea 32 mmol/l, creatinine 778 μ mol/l, Hb 11.2 g/dl, WCC 23.1 × 10/l, clotting and liver function tests were normal. Arterial blood gases: pH 7.04, pCO₂ 9.6 kPa, pO₂ 6.3 kPa, F₁O₂ 0.6. A diagnosis of acute respiratory failure due to pneumonia, septicaemic shock and acute on chronic renal failure was made. Sputum and blood were cultured and blood serology requested. The patient was started on Cefuroxime 500 mg q.d.s., Flucloxacillin 500 mg q.d.s. and a single dose of Tobramycin 80 mg intravenously. The patient



Fig. 1. Chest X-ray of patient one on admission showing bilateral confluent shadowing of lower zones

was intubated and mechanical ventilation was commenced. His cardiovascular function deteriorated, requiring adrenaline by infusion and eventually intraaortic balloon counterpulsation to support the systemic arterial pressure. His renal failure was managed with haemodialysis and haemofiltration. Frank bleeding developed from his gastrointestinal tract, lungs and all puncture sites despite normal clotting parameters. Seven days after admission the results of the psittacosis titre became available showing a rise from 1/5 to 1/20. Questioning his wife revealed a sick pet budgerigar at their home. Doxycycline therapy 100 mg b.d. intravenously was started and his clinical condition improved rapidly; cardiovascular support was withdrawn and weaning from the ventilator achieved. His renal function gradually improved. At present he no longer requires haemodialysis.

The second patient, a 63-year-old retired asbestos worker was admitted to our intensive care unit moribund and unresponsive to painful stimuli. The previous night he had complained of a cough and feeling unwell. On examination his systolic blood pressure was 50 mmHg, pulse 120/min, temperature 39.5 °C and he had coarse crepitations over both lung fields. The chest X-ray showed a predominantly left sided pneumonia (Fig. 2). Blood results on admission: Hb 12.4 g/dl, WCC $7.8 \times 10/l$, Na 141 mmol/l, K 4.5 mmol/l, urea 15 mmol/l, creatinine 140 µmol/l,



Fig. 2. Chest X-ray of patient two following Swan-Ganz catheterization showing catheter in situ and patchy shadowing of left lung field and right upper zone

alk. phosphatase 55 IU/l, bilirubin 17 mmol/l, AST 720 IU/l. Arterial blood gases: pH 7.16, pCO₂ 10 kPa, pO₂ 5 kPa, F₁O₂ 0.5. A diagnosis of acute respiratory failure due to pneumonia and septicaemic shock was made. Sputum and blood were cultured and blood serology requested. The patient was started on Cefuroxime 1.5 g t.d.s., Erythromycin 500 mg q.d.s. and Metronidazole 500 mg t.d.s. The patient was intubated and mechanical ventilation was commenced. Cardiovascular support with fluids and an adrenaline infusion was required. Renal, hepatic and clotting parameters deteriorated in the first week. Respiratory function, as determined by blood gas analysis and chest X-ray appearance, made little improvement. The result of the psittacosis titre became available on the 7th day showing a rise from 1/20 to 1/320. Further inquiry revealed that the patient's landlady kept a parrot. Tetracycline 250 mg q.d.s. intravenously was commenced followed by an improvement. Weaning from the ventilator and cardiovascular support was achieved within 2 days. Four months later the patient is asymptomatic.

Discussion

Both our patients demonstrate the rare severe form of psittacosis with acute respiratory and other organ failure [2, 5]. Psittacosis usually presents as a cough with influenza type symptoms, high fever, and a bradycardia is commonly described. The first patient had haemoptysis and abdominal pain both of which are described but uncommon in psittacosis. Myocarditis and endocarditis with a secondary glomerulonephritis are associated with the acute form of the illness [2]. Both patients developed cardiac and renal failure, the first case requiring intra-aortic balloon counterpulsation and haemodialysis with haemofiltration. Although encephalitis and meningitis can occur, the decreased conscious level of our patients was most likely due to hypoxia, hypercapnia and hypotension. Psittacosis pneumonia is difficult to distinguish from other bacterial pneumonias on the usual history or clinical findings. Legionnella and mycoplasma were both considered in these patients in view of the altered conscious state and poor renal function. However, the first case had already received erythromycin and the second had no response to erythromycin therapy. Mycoplasma pneumonia was thought to be less likely as this infection is usually institution acquired in vounger men. The chest radiograph appearance is also unhelpful in the differential diagnosis. In a review of 196 adults with community acquired pneumonia no distinctive pattern was seen on chest radiograph for pneumococcal, mycoplasma, psittacosis and legionnella pneumonia [3]. However, both our patients'

relatives gave a history of contact with psitticine birds and both had a poor response to the initial broad spectrum antibiotic therapy. Tetracyclines were only commenced following serology results. Blanket therapy of undiagnosed pneumonias with tetracyclines may lead to superinfection with resistant staphylococci especially in an intensive care unit where these organisms are always present. Tetracyclines are the treatment of choice and should be continued for 21 days since shorter courses may lead to relapse.

Chlamydia psittaci is carried by numerous avian species but particularly parrot budgerigars. Nagington reported 150 cases of Chlamydial infections from 1975 - 1983 in Cambridgeshire, of which nearly all were due to C. psittaci, based on the complement fixation test. Of the 150 reported cases 73 developed pneumonia. A presumptive bird source was present in only 17% suggesting that the infection may be endemic rather than zoonotic [4]. Another study found a presumptive bird source in 19 out of 31 cases [1]. Transmission to man may be by inhalation of dried excretions or from handling an infected bird. Person to person transmission and laboratory acquired disease have been reported but seem to be rare [2]. The incubation period is usually 1 to 2 weeks but may be as long as a month. Laboratory diagnosis is usually serological using a complement fixation test. Psittacosis titres are not routinely performed by our laboratory but results are available within 1 week when requested. In some hospitals isolation of the organism is considered hazardous, thus sputum specimens should be handled with care. A fourfold or greater rise in titre between acute and convalescent sera with a

compatible illness is considered diagnostic. The mortality of human psittacosis has fallen from between 20 and 40% to 1% as the result of effective antibiotic therapy. However, a poor prognosis is associated with increasing age, leucopenia, severe hypoxia and renal impairement [2]. Psittacosis should be considered in any patient with acute respiratory failure due to infection as well as other atypical pneumonias such as legionnella, mycoplasma or Q-fever. The importance of taking a thorough social history cannot be overemphasised. Delay in therapy which inevitably occurs while waiting for serology results may greatly increase the mortality and morbidity in the severe form of psittacosis.

References

- 1. Hill A (1984) Psittacosis of non avian origin. Lancet 2:695
- 2. MacFarlane JT, Macrae AD (1983) Psittacosis. Br Med Bull 39:163
- 3. MacFarlane JT, Miller AC (1984) Comparative radiographic features of community acquired legionnaires' disease, pneumococcal pneumonia, mycoplasma pneumonia, and psittacosis. Thorax 39:28
- Nagington J (1984) Psittacosis/ornithosis in Cambridgeshire (1975 - 1983). J Hyg 92:9
- Van Berkel M, Dik H, van der Meer JWM, Versteeg J (1985) Acute respiratory insufficiency from psittacosis. Br Med J 290:1503

Dr. W.J. Kox Intensive Care Unit Department of Anaesthesia Charing Cross Hospital London W6 8RF UK